REMARKS

It is believed that the following remarks attend to all rejections and objections presented in the pending April 17, 2002 office action; these remarks are numbered with corresponding paragraphs to this office action.

37 CFR §1.58(a) Objections

1. The substitute specification attends to the issues raised by the Examiner under this paragraph. Proposed formal drawings are also attached in the substitute specification, including a new appendix. A marked up version of the specification is also attached clearly showing changes thereto. The new background and summary are prepared based clearly on disclosure in the as-filed application, and from disclosure of Appendix A of the provisional application, as well as U.S. Patent No. 5,636,146, incorporated by reference. No new matter is added. Applicant kindly requests acceptance of the proposed substitute specification in responding to paragraph 1 of the pending action. Note that the reference to Appendix A was deleted as it was part of the provisional application, incorporated in full by reference to this pending non-provisional application.

Claim 1 was amended for purposes of clarity only; and camcorder was replaced with the broader term "digital camera", as supported by as-filed FIG. 1 and related text in the specification.

Claims 1-12 are pending in this application. Claim numbering 1-9 was corrected in this amendment due to duplicate numbering of claims 6 and 7, and are now claims 1-11. Claim 7 was bifurcated into claim 7 and new claim 12, both dependent on claim 1.

Claim Rejections - 35 USC § 103

2. Claims 1-11 stand rejected under 35 USC § 103 as being unpatentable over U.S. Patent No. 6,324,296 ("McSheery") in view of U.S. Patent No. 6,157,898 ("Marinelli"). Applicants respectfully disagree and traverse the rejections. Applicants argue that McSheery and Marinelli do not render any of the claims *prima facie* obvious, as explained below.

The following is a quotation of from the MPEP setting forth the three basic criteria that must be met to establish a *prima facie* case of obviousness:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

MPEP, § 2142, citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

First of all, McSheery and Marinelli in combination do not teach every element of claim 1, as required by 35 USC §103. Specifically, amended claim 1 requires the following steps:

(1) viewing the sportsman through a digital camera;

(2) assessing frames of data provided by the digital camera to locate motion within the frames of data; and

(3) determining the peak altitude by comparing the highest point of motion by the sportsman within the frames of data to a reference object.

McSheery discloses tracking individually-modulated light points; a camera is used to image light in the motion capture environment along two axes. *See col. 5, lines 17-30.* Not once does McSheery disclose determining a peak altitude or viewing a moving sportsman through frames of data from a digital camera. Importantly, McSheery is absolutely silent as to comparing a highest point of motion of the sportsman to a reference object, as required by claim 1 and shown clearly in Applicants' FIG. 1.

Marinelli also does not teach these steps. The Examiner states that Marinelli discloses determining peak altitude; however Marinelli never teaches use of a digital camera or the utilization of frames of data and a reference object to determine the peak altitude. Marinelli specifically and only discloses an accelerometer network 102 attached to an object like a baseball; never once does Marinelli disclose a digital camera viewing an athlete to determine altitude.

Accordingly, by these reasons alone Marinelli and McSheery fail as 35 USC §103 references.

In addition, Marinelli and McSheery fail as 35 USC §103 references since there is no motivation to combine the references. There is, specifically, no motivation within Marinelli and McSheery to combine the references. The Examiner states that one skilled in the art could modify McSheery with Marinelli to render claim 1. However, Applicants argue that such a statement relies on hindsight. Applicants further request specific evidence of motivation combining Marinelli with McSheery in the prior art since such evidence is lacking. *MPEP 2144.04.* Marinelli with McSheery do not, as required 35 USC § 103, suggest or motivate combining with one another. Applicants wish to point out that "the level of skill in the art cannot be relied upon to provide the suggestion to combine references" (*MPEP 2143; Al-Site Corp. vs. VSI Int'l Inc.,* 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999)). Accordingly, if this rejection should persist, Applicants request evidence motivating the combincation of Marinelli with McSheery under this rejection, as permitted under *MPEP 2144.04.*

Marinelli and McSheery are also not analogous art, as Marinelli teaches flight characteristics of a baseball and McSheery discloses converting movement to computer usable form, for applications such as animation.

Finally, even if McSheery were modified according to Marinelli, claim 1 would not be rendered, at least because Marinelli teaches an accelerometer network, not a digital camera and processing of frames of data. A reasonable chance of success cannot be maintained with such a combination.

For these reasons and more, Applicants request reconsideration of claim 1. Claims 2-7 depend from claim 1 and benefit from like arguments. In addition, claims 2-7 have at least the following patentable distinctions over McSheery and Marinelli:

Claim 3 – neither McSheery nor Marinelli disclose the step of automatically determining a motion track of the sportsman through time.

Claim 4 - neither McSheery nor Marinelli disclose the step of determining airtime from the track.

Claim 6 - neither McSheery nor Marinelli disclose the step of determining the speed of the sportsman by evaluating physical movement of the sportsman through successive frames of data.

Claim 12 - neither McSheery nor Marinelli disclose the step of capturing the frames of data at 60Hz or more, to provide enhanced accuracy in calculation of metrics such as airtime.

Accordingly, Applicants request reconsideration of each of claims 1-7, 12.

Amended claim 8 is an independent claim requiring the following step elements:

(1) mounting a radio beacon on the sportsman,

(2) monitoring the location of the sportsman through triangulation to determine the location of the sportsman over time, and

(3) determining the airtime from the location over time.

McSheery teaches tracking individually-modulated light points; pairs of cameras are used to position the light points in 3D. *See col. 3, lines 33-41.* Not once does McSheery disclose determining airtime of a moving sportsman, or using a radio beacon. Marinelli also does not teach these steps. Marinelli does not disclose determining airtime of a sportsman. The Examiner states that Marinelli discloses determining peak altitude; however Marinelli never teaches use of a radio beacon and triangulation. Marinelli specifically and only discloses an accelerometer network 102 attached to an object like a baseball; never once does Marinelli disclose triangulation.

In order to be proper 35 USC §103 references, McSheery and Marinelli must disclose each and every element of claim 8. They do not do this. Moreover, McSheery and Marinelli are not analogous art, as noted above. Further, Applicants request evidence of motivation to combine McSheery and Marinelli, as Applicants claim such motivation is lacking. . *MPEP 2144.04.* Even if combined, the result would not render claim 8 since McSheery and Marinelli do not teach all

elements. Applicants again point out that "the level of skill in the art cannot be relied upon to provide the suggestion to combine references" (*MPEP 2143; Al-Site Corp. vs. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999)).

For these reasons and more, Applicants request reconsideration of claim 8. Claims 9-11 depend from claim 8 and benefit from like arguments. In addition, claims 9-11 have at least the following patentable distinctions over McSheery and Marinelli:

Claim 9 – neither McSheery nor Marinelli disclose determining a peak speed of the sportsman during motion of the sportsman by evaluating the location through successive time intervals.

Claim 10 – neither McSheery nor Marinelli disclose determining a final speed of the sportsman just prior to a landing by determining a final speed of the sportsman just prior to the landing.

Claim 11 – neither McSheery nor Marinelli disclose determining the airtime of the sportsman by evaluating the motion of the sportsman through the air from a first ground location to a landing location.

For the reasons stated above, Applicants argue that claims 1-12 are allowable over the art of record. Applicants request an opportunity to interview this case in the event any claims are further rejected so that these issues may be better framed prior to appeal.

The $55 fee for a one-month extension has been submitted. It is believed no additional fees are due. If any additional fee is due, please charge Deposit Account No. 12–0600.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the abstract:

ABSTRACT

A digital camera system is provided to measure a moving sportsman, for example to determine peak altitude, spin ratio and airtime. A wireless triangulation system is provided to track a moving sportsman to determine metrics such as peak altitude, rotation, drop distance and airtime. A stride-rate system is provided to determine stride-rate or to assist in training for sports such as roller-blading.

MARKED-UP VERSION OF AMENDED CLAIMS

In the Claims:

1. (Once amended) A method for determining peak altitude of a moving sportsman, comprising:

viewing the sportsman through a [camcorder] digital camera;
assessing frames of data provided by the digital camera [camcorder] to locate motion within the frames of data; and
determining the peak altitude by comparing the highest point of motion by the sportsman within the frames of data to a reference object [to calculate the actual altitude achieved by the sportsman along a motion track].

2. A method of claim 1, further comprising the steps of sending the frames of data to a computer through a data link and evaluating the frames of data to determine motion within the frames.

3. A method of claim 2, further comprising the step of automatically determining a motion track of the sportsman through time.

4. A method of claim 3, further comprising the step of determining airtime from the track.

5. A method of claim 4, wherein the camera comprises a digital camcorder and wherein the link comprises a Firewire connection.

6. A method of claim 3, further comprising the step of determining the speed of the sportsman by evaluating physical movement of the sportsman through successive frames of data.

7. (Once amended) A method of claim 1, further comprising the step of capturing the frames of data at at least 30Hz [and preferably at 60-100Hz or more].

[6]8. (Once amended) A method of determining the [location, peak and final speed, and] airtime of a moving sportsman, comprising the steps of mounting a radio beacon on the sportsman, [and] monitoring the location of the sportsman through triangulation to determine the location of the sportsman over [at any instant of] time, and determining the airtime from the location over time.

[7]9. (Once amended) A method of claim [6]8, further comprising determining a peak speed of the sportsman during motion of the sportsman by evaluating the location through successive time interval[e]s.

[8]10. (Once amended) A method of claim [6]8, further comprising determining a final speed of the sportsman just prior to a landing by determining a final speed of the sportsman just prior to the landing.

[9]11. (Once amended) A method of claim [6]8, further comprising determining the airtime of the sportsman by evaluating the motion of the sportsman through the air from a first ground location to a landing location.

12. (New) A method of claim 7, further comprising the step of capturing the frames of data at more than 60Hz.

CLEAN SET OF ALL PENDING CLAIMS

1. (Once amended) A method for determining peak altitude of a moving sportsman, comprising:

viewing the sportsman through a digital camera;
assessing frames of data provided by the digital camera to locate motion within the frames of data; and
determining the peak altitude by comparing the highest point of motion by the sportsman within the frames of data to a reference object.

2. A method of claim 1, further comprising the steps of sending the frames of data to a computer through a data link and evaluating the frames of data to determine motion within the frames.

3. A method of claim 2, further comprising the step of automatically determining a motion track of the sportsman through time.

4. A method of claim 3, further comprising the step of determining airtime from the track.

5. A method of claim 4, wherein the camera comprises a digital camcorder and wherein the link comprises a Firewire connection.

6. A method of claim 3, further comprising the step of determining the speed of the sportsman by evaluating physical movement of the sportsman through successive frames of data.

7. (Once amended) A method of claim 1, further comprising the step of capturing the frames of data at at least 30Hz.

8. (Once amended) A method of determining the airtime of a moving sportsman, comprising the steps of mounting a radio beacon on the sportsman, monitoring the location of the sportsman through triangulation to determine the location of the sportsman over time, and determining the airtime from the location over time.

9. (Once amended) A method of claim 8, further comprising determining a peak speed of the sportsman during motion of the sportsman by evaluating the location through successive time intervals.

10. (Once amended) A method of claim 8, further comprising determining a final speed of the sportsman just prior to a landing by determining a final speed of the sportsman just prior to the landing.

11. (Once amended) A method of claim 8, further comprising determining the airtime of the sportsman by evaluating the motion of the sportsman through the air from a first ground location to a landing location.

12. (New) A method of claim 7, further comprising the step of capturing the frames of data at more than 60Hz.